TRINIDAD AND TOBAGO

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of the

Director of Agriculture

for the Year

1945.

1946.

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AGRICULTURE.

Administration Report of the Director of Agriculture for the year 1945.

INTRODUCTION.

During the year the Department was short of staff, particularly of trained field staff, but despite this some headway was made in the reorganisation of District Extension Services. The continuation of a planting subsidy in respect of sugar cane rendered necessary the retention of a special field staff for the purpose of measuring and checking work on several thousands of cane plots, many of small size, and continued to be a strain on District staff. The work of maintaining local food production at a high level was assumed by the Department of Agriculture, this activity having been carried out formerly by a department directed by an Officer in Charge of Local Food Production working under the Food Controller and arrangements were made, in the course of the year, to transfer all field activities connected with local food production to the reorganised District Services.

2. A large area of Government owned land has been rented to food growers during the war years on annual tenancy at a nominal rent of one dollar per acre, and in order to provide that security of tenure which is necessary to induce the proper care of the land and to encourage permanent settlement Government has accepted proposals to grant suitable tenants leases of twenty-five years duration at an economic rental, the leases making provision for the payment of compensation for improvements to outgoing tenants and, conversely, payment by the tenants for neglect.

3. The report of the Agricultural Policy Committee of Trinidad and Tobago was accepted by Government during the year as an ideal towards which agricultural effort should be directed as funds and circumstances permitted. The implementation of the majority of the recommendations of the Committee calls for much investigational work if recommendations are to be made on the basis of accurate knowledge obtained from planned experiments. The most urgent needs of the Department of Agriculture are, therefore, the establishment of a well equipped central experiment station on which specialist officers are resident in order to secure the basic knowledge required and, also, facilities which will permit of the technical training of subordinate field officers to enable them to give full guidance to farmers.

4. Against the background of the previous paragraph agricultural policy would be directed :—

(i) To prevent the exploitation of the soil and to endeavour to improve its productivity under agricultural management.

(ii) To encourage the production of local food crops bearing in mind the importance of nutritionally desirable foods both for man and livestock, to supply improved planting materials and to advise upon methods of production.

(iii) To encourage the maintenance of livestock in increased numbers and of improved productive capacity in the interests of the improved nutrition of the people and of soil fertility and to conduct investigations towards these ends.

(iv) To aid the established sugar cane, coconut, cocoa and citrus industries by assistance in the supply of improved planting material and of technical advice based on the results of field experiments.

(v) To prosecute investigations designed to expand the range and improve the quality of economic crops both for export and local consumption by field trials of indigenous and imported species.

(vi) To encourage a healthy outlook on agriculture as a mode of life by the expansion of vocational education in agriculture and the creation of an informed extension service. To facilitate settlement on the land under secure tenure.

(vii) To stimulate co-operation amongst agriculturists with the object of co-operative marketing and to provide a channel for the granting of financial assistance to productive enterprises.

SECTION I—AGRICULTURE IN THE COLONY IN 1945.

General Conditions.

Weather conditions throughout the year were generally good. The main dry season was neither severe nor prolonged and a feature of the year was the almost complete absence of the normal short dry spell in the autumn known as the *petit careme*. Rainfall at St. Clair was 71.66 inches compared with 67.78 inches in 1944 and with an 84 year average of 63.48 inches. The rainfall recorded for representative localities throughout the Colony was as follows :—

Port-of-Spain	... 67.20 inches
St. Joseph, Government Farm	... 63.85 do.
Waterloo, Carapichaima	... 65.75 do.
Siparia, Police Station	... 60.87 do.
Cedros, Perseverance Estate	... 72.75 do.
Toco, Police Station	... 71.29 do.
Diego Martin, River Estate	... 78.48 do.
Couva, Esperanza Estate	... 53.20 do.
Rio Claro, Police Station	...110.43 do.
Naparima, Usine Ste. Madeleine	... 57.80 do.
Tobago, Botanic Station	... 81.17 do.

2. The labour position with respect to Agriculture showed a further improvement during the year with the release of thousands of local men previously employed on construction and maintenance work in connection with the leased bases, aerodromes, etc. These men were readily absorbed by the various agricultural industries according to the prosperity of such industries. Thus the sugar and coconut crops were able to absorb labour at an economic wage whereas cocoa for instance, in its present depressed state, was unable to compete with the higher wages now demanded.

3. The majority of consumer goods was still subject to control during the year but were in adequate supply to ensure the incentive for production.

Agricultural Products for Home Consumption.

Food Production.

4. Efforts were made to ensure that food crop production should be maintained at not less than the satisfactory level achieved in 1944 and it is gratifying to report that the response was good. Supplies reaching the markets were good throughout the year and there was a notable improvement both in the length of the seasons over which individual crops were harvested and in the balance as between crops.

5. *Ground Provisions.*—There was no seasonal shortage of ground provisions which is normally experienced from July to September. Eddoes and dasheen were again produced in excess of actual requirements but the surplus was far less than in 1944. The sweet potato crop was below expectation, that part maturing at the end of the year being affected by adverse weather. Tobago continued to supply a large part of the total sweet potato crop. The crop suffered from an outbreak of Black Rot disease in the Speyside area which is receiving attention. The cultivation of good yams of the Lisbon type showed a further increase but there is still a marked demand for further production.

6. *Grain Crops.*—A good crop of rice was harvested from an increased acreage. In the South, the crop was a record one where a small decrease in the Oropouche Lagoon area was more than offset by production from small swamp areas and from hill paddy grown on War Gardens. Corn (maize) showed a decrease on the 1944 crop, the larger crops of the three previous years being due to the good growth obtained from lands clear felled from tree crops. There was a reduced demand however for green corn-on-the-cob and production of shelled corn met immediate requirements.

7. *Pulses.*—Pigeon peas showed an increased acreage but the supply of both green peas and dried peas does not yet satisfy the demand. The cultivation of black-eyed peas and salad beans was further developed as a dry season crop for the lagoon and garden areas.

8. *Vegetables.*—Vegetable production in 1945 was very satisfactory and, aided by favourable weather, was well distributed throughout the year showing a great improvement over former years when the tendency was for a glutted market in the few weeks of the dry season with a scarcity during the remainder of the year. Cabbage, cauliflower, tomatoes, lettuce, chinese cabbage, mustard, spinaches, salad beans, cucumbers, egg plant, squashes and water cress were the principal vegetables produced.

9. *Fruit.*—Production of fruit generally in 1945 was satisfactory and sufficient to meet, in variety, local demands.

Livestock.

10. *Diseases.*—There were no outbreaks of a major nature of animal diseases during the year. Details of the various diseases occurring are given in Section II of this report.

11. *Feeding Stuffs.*—A liberal supply of oats and grain was made available to the sugar estates and cane farmers during the crop season and on the whole the amount of concentrates available for livestock during the year was satisfactory. The Marketing Division of this Department continued to prepare a dairy mixture for cows and goats with good results.

12. *Importation of Animals.*—The following animals were imported into the Colony and inspected during the year by the Veterinary Division :—

Animals for Food.

Type.	*Source.*	*Number.*	*Total Number.*
Cattle ...	...Venezuela	16,547	16,547
Goats ...	...B.W.I.	3,623	
	Venezuela	7,109	10,732
Sheep ...	...B.W.I.	1,436	
	Venezuela	264	1,700
Swine ...	...B.W.I.	2,742	2,742

Animals for Breeding and Work.

Type.	*Source.*	*Number.*	*Total Number.*
Goats ...	...B.W.I.	14	14
Sheep ...	...B.W.I.	4	4
Horses ...	...U.K.	2	
	Canada	27	
	B.W.I.	50	
	Venezuela	3	82
Mules ...	...B.W.I.	16	
	U.S.A.	75	
	Venezuela	81	172
Asses... ...	...U.S.A.	4	4

In addition seven dogs were imported from various sources.

13. *Livestock Shows.*—The Annual Goat Show was held on the Queen's Park Savannah in the paddock of the Trinidad Turf Club in April and again proved a great success. The three pure-bred British Alpine bucks (Didgemere strain) and the two Anglo-Nubian (Malpas strain) received by the Department from the United Kingdom in December 1944 were exhibited with other goats from the Stock Farm, but not for competition. In the milking competition the winning goat gave 1½ gallons of milk and the average yield per goat in the competition was a little over ¾ gallon.

14. The Annual Cane Farmers' and Peasants' Livestock Shows in the Sugar Belt were again held at the end of cane crop and the competition in each district was quite keen. Seven such shows were held.

15. *Juvenile Farm Clubs.*—The Juvenile Farm Clubs' activities in Tobago were maintained throughout the year with regular quarterly inspections, but in the case of the Trinidad schools inspection was confined to a visit at the end of the year when stock was judged for the award of prizes.

AGRICULTURAL EXPORTS IN 1945.

16. There was a marked improvement in the Agricultural exports of the Colony during 1945, the total value being $9,876,651 as compared with $7,892,910 in the previous year. Sugar and its bye-products and coconut and coconut products accounted for the bulk of the gain while the value of raw cocoa exported showed a decrease of $331,749.

17. The details of the 1945 exports are given below :—

		Quantity.	*Value.* $	*Value.* $
SUGAR AND BYE-PRODUCTS :				
Sugar	...tons	59,368	4,407,152	
Molasses	...gals.			
Rum	...proof gals.	924,450	1,421,879	5,829,031
COCOA :				
Raw Cocoa	...lb.	7,731,824	1,080,047	
Cocoa Butter	...lb.	14	8	
Prepared Cocoa	...lb.	5,968	2,861	1,082,916
CITRUS :				
Lime Oil—Distilled	...lb.	23,300	182,112	
Lime Oil—Hand pressed	...lb.			
Raw Lime Juice	...gals	92,008	71,637	
Limes Fresh	...lb.	6,244	457	
Citrate of Lime	...lb.	177,194	20,890	
Fresh Grapefruit	...No.	187,842	5,428	
Fresh Oranges	...No.	1,820,322	34,634	
Canned Grapefruit Juice	...gals.	253,274	236,538	551,696
TONCA BEANS	...lb.	108,920	116,964	116,964
RUBBER RAW	...lb.	473,905	361,201	361,201
COFFEE :				
Raw Coffee	...lb.	1,319,362	168,691	
Prepared Coffee	...lb.	38,894	12,354	181,045
COCONUTS AND COCONUT PRODUCTS :				
Copra	...lb.	3,530,064	279,164	
Edible Oil	...gals.	159,832	241,908	
Coconut Oil	...gals.	245,958	321,945	
Margarine	...lb.	288,700	78,092	
Lard Substitute	...lb.	434,937	110,366	1,031,475
SOAPS HARD	...lb.	653,030	88,909	88,909
SOAP STOCK	...lb.	345,600	13,629	13,629
FRESH VEGETABLES	...lb.	213,352	40,682	40,682
FRESH FRUIT	...lb.	81,374	4,242	4,242
BANANAS	...Stems	1,299	3,045	3,045
PEAS AND BEANS	...lb.	3,750	273	273
LIVESTOCK AND HIDES :				
Livestock	...	—	8,672	
Hides	...lb.	161,290	16,826	25,498
BITTERS	...proof gals.	49,635	437,850	437,850
HONEY	...lb.	60	82	82
MISCELLANEOUS	...	—	108,113	108,113
TOTAL VALUE OF EXPORTS				$9,876,651

Sugar.

18. *Production.*—The sugar output in 1945 was 76,347 tons compared with 74,262 tons in 1944. This production is still only some 50 per cent. of the production in 1936 and 1937 which years may be taken as normal ones and it will not be until 1946 and the following years before the results of the replanting campaign commenced in the latter part of 1943, will be felt. The success of this campaign, which was helped by a replanting subsidy, is reflected in the following figures :—

Area Planted in Canes.

1943— 5,446 acres

1944—15,151 acres

1945—15,000 acres (estimated).

The value of this planting subsidy was $40.00 per acre in 1943 and 1944 and $20.00 per acre in 1945. The subsidy was met from Colony funds in 1943 and from Imperial Government Funds in 1944 and 1945.

19. For the 1945 crop, the quantity of canes ground was 490,445 tons from estates and 234,950 tons from farmers, the average out-turn being 9.51 tons of cane per ton of sugar. Only some 8,000 tons of cane remained unreaped at the close of the season compared with 107,000 tons which had to be left as standover canes in 1944.

20. *Labour Conditions.*—As reported above, labour conditions showed a marked improvement. At the commencement of the year, the Sugar Manufacturers' Association signed an agreement with the All Trinidad Sugar Estates and Factories Workers' Trade Union whereby an increase of 15 per cent. on 1944 basic rates was given to all workers, as well as holidays with pay. The year was notably free from labour disputes but an improvement both in the labour supply and in attendance and output of existing labour will be necessary to meet the prospects of the larger crops in 1946 and 1947.

21. *Price of Canes.*—Under Ordinance No. 9 of 1944, a minimum price of $5.50 per ton of canes was guaranteed. According to the formula under this ordinance, the price was calculated at $5.84 per ton and this price was paid in full, Government not exercising its option of levying a cess of half the difference between this price and the figure of $5.50.

22. Wet season planting progressed well and damage from froghopper was small. The weather during the last two months of the year was very favourable for the growth and maturing of canes for the 1946 crop, the sugar output for which is estimated at 98,000 tons.

23. Estates are paying increasing attention to improving the yield per acre both of sugar and cane. Improved varieties, better cultivation and the use of fertilisers are all playing their part. Mechanisation of work in the field is producing good results through improved tillage and the ability which mechanisation gives of carrying out cultural operations at the optimum time. Woodford Lodge Estates Ltd. merit especial mention for progress they have made in this respect and for the valuable investigational work carried out with various types of implements.

Cocoa.

24. Exports of raw cocoa during the calendar year were 7,731,824 lb. compared with 10,622,633 lb. in 1944. The Island Ward of Tobago accounted for some 22 per cent. of this total. The cocoa industry remains in a very depressed state. Witchbroom disease is so heavy in some areas that it would be uneconomic to open up the abandoned cocoa estates. In other areas, the return from the low yields potentially available are, at the current price of $13.25 per fanega or approximately 12 cents per pound, insufficient to be able to attract labour at a wage rate of the scale payable in the sugar or coconut industries. These low yields are the result of disease and of the neglect of the plantations and their combined effect has been the abandonment or semi-abandonment of many cocoa properties.

25. This abandonment has again in its turn led to an increase of vermin in the form of rats and squirrels which take a heavy toll of the crop. Cartridges were more readily available during the latter part of the year which enabled some check to be kept on this menace.

26. The year saw the first distribution of high-yielding cocoa cuttings under the Cocoa Rehabilitation Scheme and some 90,000 plants were so distributed. Further reference to the production of plants of high yielding clonal cocoa is made in Section II of this report.

27. The general neglect of the industry was also evident in the reaping and curing of the beans and the finished product was much below the normal good standard of Trinidad cocoa. Attention is now being paid, on an experimental basis, to methods of fermentation and drying designed to bring out the maximum flavour and merchants have also agreed to a voluntary system of spot inspection prior to shipment with a view to tracing defects.

Coconuts.

28. With an increase in the price of copra from $4.75 to $7.00 per 100 lb., and with a good crop following satisfactory rains in 1944, the coconut industry has shown a marked revival. With an improving labour supply, plantations had the chance of being brought back to full production by adequate cultivation and the possibility of the full crop being harvested. 35,386,605 lb. of copra were delivered to the various factories for oil manufacture during the year and besides fully meeting the Colony's requirements, the amount of edible and coconut oil and of margarine and lard substitute exported is shown at paragraph 17 above.

29. Total production of copra for the year is estimated at 38,916,669 lb. compared with 29,313, 693 lb. in 1944 and 21,670,531 lb. in 1943.

OTHER CROPS.

Citrus.

30. The lime crop continues to decrease, the premature dying out of trees outweighing the more recent plantings now coming into bearing. The condition is a serious one and to date no causative organism has been traced to explain what has been called "root disease" of limes. Apart from such measures as organic manuring, windbreaks, shade trees and contour drainage advocated to alleviate or rather delay "root disease", the almost complete neglect of any cultural operations or of manuring is bound to lead to the deterioration of the trees.

31. The grapefruit harvest was satisfactory and besides the Colony's demands for fresh fruit being met, the Co-operative Citrus Growers' Association were able to can some 115,000 cases of grapefruit juice during the 1944-45 season. Prospects for the year 1945-46 season are estimated to show an increase of some 70 per cent. in this respect.

32. The efficient cultivation and manuring of the great majority of the grapefuit plantations is in marked contrast to the poor attention given to the other citrus crops and in particular to the lime crop.

Tonca Beans.

33. The price of this product ranged from 60 cents to $1.00 per lb. delivered Port-of-Spain. Treated as a forest tree with little or no cultural treatment, the large number of older trees planted on the poorer soils are naturally now only producing small crops. Production over the last three years has been :—

1943—186,615 lb.
1944—105,797 lb.
1945—103,920 lb.

Coffee.

34. The large export of Robusta coffee shown under paragraph 17 above represents accumulated stocks which became available for export on the revocation of Proclamation No. 6 of 1943 whereby export had been confined to the other West Indian Islands which market had latterly only taken small amounts.

35. Purchases of Robusta were effected at about 9 cents per lb., an appreciable drop from the price of 16 cents to which latter level the price had climbed from 5 cents per lb. when internal demand had soared with the influx of personnel to the leased bases.

36. Actual production of Robusta during 1945 was estimated at 1,100,000lb. showing a reduction of some 35 per cent. on 1944 figures.

37. The quantity of Arabica coffee produced is much less than that of Robusta and is fully absorbed locally at around 14 cents per lb.

Rubber.

38. The success of the drive for maximum rubber production is reflected in the following figures of total production from all sources which may now be published :—

1943	...	...	...	...300,508 lb.
1944	...	...	...	...449,745 lb.
1945	...	...	...	...490,753 lb.

39. During the War years, the entire rubber production of the Colony was, by agreement, made available to the Government of the United States of America through the agency of the Rubber Development Corporation. The basic price for Hevea ribbed smoked sheet of first quality f.o.b was 48 cents United States currency per pound and in addition, bonuses were payable at the rate of an additional 5 cents per pound for every pound over 100 tons and an additional 5 cents per pound over 150 tons of each 365 days production. This agreement has now been extended up to the 30th June, 1947.

SECTION II—WORK OF THE DEPARTMENT OF AGRICULTURE.

40. The severe shortage of staff mentioned in the 1944 Report was only partially relieved, two senior vacancies being filled during the year. Mr. E. W. Leach arrived in the Colony on transfer from the Gambia on January 28th and assumed the duties of Deputy Director (Crop Husbandry) and Dr. E. Phillis took up the duties of Chief Scientific Officer on 3rd December.

41. The following appointments, financial provision for which was made in the 1945 Estimates, were among those remaining unfilled throughout the year :—

Economic Botanist,
Soil Survey Officer,
Sugar Agronomist,
Assistant Sugar Agronomist,
Agricultural Officer (two) and
Veterinary Officer (two).

District Work.

42. Reorganisation of the District Services was undertaken during the year. The Colony was divided into three divisions each of which will normally be under the charge of an Agricultural Officer and these officers are directly responsible to the Senior Agricultural Officer. The staff of Field Assistants Grade II, whose duties were formerly almost solely confined to plant protection work, have been brought into the district extension service and they, working under the Agricultural Assistants will enable the closest contact to be kept with producers throughout the Colony.

43. Much time of the District Staff was again taken up with the Sugar Cane Planting Subsidy, some 10,000 acres of estate land and 5,000 acres of cane farmers' land being inspected and measured, the bulk of the latter acreage being made up of small scattered parcels of land.

44. Apart from the demonstration farm of 20 acres already being established within the confines of River Estate, a commencement was made with the programme for a series of demonstration farms and departmental sub-stations throughout the Colony by the acquisition and the clearing of sites at Rio Claro and Sangre Grande. Progress on these stations has been slowed down through delay in the erection of the necessary buildings. Further sites have also been chosen at Louis d'Or, Tobago, and in the Oropouche Lagoon area.

45. The aim of these farms is to demonstrate systems of mixed farming whereby the land is kept in continuous use by the employment of crop rotations and by the keeping of various forms of livestock as part and parcel of the farming project.

46. On the large farms, observational and experimental work will be also carried out on the various high-yielding cocoa clones with a view to selecting the clones best suited to that particular area.

47. District work has also included crop survey and plant protection work, the supervision of cocoa rehabilitation, assistance with school gardens, inspections of Agricultural Bank properties and reports on applications for the lease of Crown Lands as well as the provision of current notes on crops and crop prospects.

48. The above constitutes a full programme for an organised and well-trained extension staff and reinforces the need for a Farm Institute where such staff may be trained. It is gratifying to record that funds have already been voted for this project.

Local Food Production and Marketing.

49. On 1st January, 1945, the Local Food Production and Marketing Division was transferred from the Food Control to the Agricultural Department and at the same time funds were voted for the establishment of an embryo Fisheries Division to be administered for the time being as part of the Production and Marketing Division. The Marketing and Co-operative Officer, Mr. A. E. Trotman, was in charge of this work throughout the year and reports in part as follows :—

50. *Food Production.*—The measure of the success of the 1945 food production campaign which was aided by continuing the policy of guaranteeing to purchase unlimited quantities of certain food crops was shown by satisfactory production. (*See* also paragraphs 4 to 9 of this report).

51. *War Garden Allotments.*—Additional war garden allotments were given out in many districts early in the year, but after the surrender of Japan in August no further tenants were put on the land. Every effort was made to stimulate tenants to make the best use of their allotments and to collect all rents due, but later in the year tenants who, without good reason, had failed to make reasonable use of their holdings or had not paid their rent were dispossessed and their tenancy agreements terminated. At the end of the year 9,591 tenants were in possession of 12,133 acres as compared with 9,844 tenants and 12,530 acres at the beginning of the year, a net reduction of 253 tenants and 397 acres.

52. In accordance with Government's decision that consideration should be given to the desirability of establishing on a permanent basis activities which were necessary to meet the war emergency, proposals were submitted for transferring responsibility for administering the war garden scheme to the District Staff, and for a permanent garden allotment scheme, to be administered jointly by the District Staff and Wardens, to take the place of the temporary war garden scheme. These proposals were approved in principle and details were then worked out in discussion with the Sub-Intendant, Wardens and Agricultural Officers.

53. *Marketing.*—The marketing organisation continued to operate on the same basis as in 1944, the principal object being to stimulate local food production by providing producers in all parts of the Colony with an assured market for those crops which Government had guaranteed to purchase, and by securing the widest practicable distribution of crops in good supply and storing seasonal surpluses for consumption later. Other activities included marketing fresh fish, mixing and distributing balanced dairy rations, importing and distributing vegetable seeds, insecticides and fishing tackle and distributing local planting material and cartridges.

54. *Produce.*—The marketing facilities provided by private enterprise improved very considerably during the year as a result of a continuous improvement in the road transport situation combined with the release of men formerly employed on military projects, quite a number of whom sought to make a living as dealers. Increased activities of competitive buyers in nearly all districts removed the need for maintaining many Marketing Depots and those at which the turnover became insufficient to warrant continued operation were closed down after the peak harvesting period had passed. At the end of the year five depots (open every day) and 24 sub-depots (open one day per week) were in operation as compared with eight depots and 36 sub-depots at the beginning of the year and eight depots with 44 sub-depots at the height of activities in 1943 and 1944. Of the 24 sub-depots still in operation eight are in County St. David and eight in Tobago.

55. For the foregoing reasons, purchases fell from 5,363,211 lb. for which $128,711.67 was paid in 1944 to 3,015,146 lb. costing $72,636.54 in 1945 but the trading profit increased from $3,128.59 in 1944 to $9,759.67 in 1945.

56. In considering the trading profit quoted in the foregoing paragraph, it is necessary to observe that at certain seasons, the Department was obliged, in fulfilment of Government's guarantee, to purchase commodities which were known to be in excess of competitive requirements.

57. At other times, the Department was able to purchase commodities which were in heavy supply but which it had not guaranteed to purchase and to dispose of them through various channels to the best advantage, thereby assisting individual producers who could not have sold to dealers on a free market.

58. *Stockfeed.*—The Marketing Division supplied Government with its feeding stuff requirements throughout the year and this service was extended to all other departmental stations in August.

During the whole year, 570 tons of balanced ration were sold through Marketing Depots to private stock owners and 440 tons to departmental stations.

59. *Fish.*—The fish marketing scheme continued to operate at four depots, comparative purchases being :—

	1944	1945
Matelot	151,966 lb.	156,610 lb.
Grande Riviere	5,756 lb.	9,845 lb.
Toco	25,931 lb.	44,901 lb.
Mayaro	129,245 lb.	194,816 lb.
	312,898 lb.	406,172 lb.

60. While the purchase and sale of fish was carried on as a direct Government venture, efforts were directed to preparing the ground for the eventual establishment of co-operative marketing societies of fishermen to take over this activity. Fishermen's Associations were formed to facilitate consultations and discussions leading to a proper understanding of the ultimate aim, and monthly reports and statements of accounts on each depot were discussed with the Association concerned.

61. *Fisheries.*—Acting upon recommendations of the Rochford Committee, Dr. Brown, Director of Fishery Investigations on the staff of Development and Welfare in the British West Indies, and, finally, the West Indian Conference, Government decided to set up an embryo Fisheries Division on a temporary basis, and a selected officer was seconded to the post of Assistant Fishery Officer in March. At the same time, earlier plans for systematic observations and records of fishing activities and the productivity of each type of gear and the species of fish landed at various beaches were put into operation.

62. A good deal of information has been received from 14 landing places around Trinidad and Tobago which, when analysed, should be of considerable value and arrangements have been made to continue these observations in 1946 and to study the information already available.

Land Settlements.

63. The Land Settlement Committee held three meetings during the year when the Chairmanship of these Committees was taken over by the Director of Agriculture from the Sub-Intendant of Crown Lands on the recommendation of the Agricultural Policy Committee.

64. The Land Settlement Supervisor, Mr. P. M. Hosten, reports the following progress during the year.

65. With the exception of 14 acres of land adjoining the La Pastora Settlement, no further land was acquired and development work was mainly confined to the lay-out and road construction of sites already acquired and on improvements in this respect to existing settlements.

66. Work on three new settlements was completed during the year and the parcels of land thereon allocated at St. Helena near Matelot, at Agostini Village in County Caroni and at La Reconnaissance in the Lopinot Valley. Work is also well forward at the Munroe Road Settlement which is designed largely to provide housing and garden sites for peasant farmers formerly living in the Bejucal Irrigation Area.

67. Other new proposed settlements, development of which is proceeding include the La Clarita and Carmencita Estates at Rio Claro.

68. The general standard of agriculture on many settlements leaves much to be desired but improvement although slow, can be recorded. In this respect, the two demonstration allotments run by the Department at La Pastora and at Brooklyn are developing a useful purpose in gaining the interest of the settlers in the need for planning their cropping, the value of manures and of rotations, the keeping of livestock and the use of improved implements.

69. There has been a steady increase in the livestock population on settlements and this has been assisted through loans from the various Agricultural Credit Societies, through departmental assistance with the purchase of pigs from Tobago and through the stationing of Stock Breeding Units at various settlements. Livestock acquired by settlers during the year include 118 cows, 103 pigs and 93 goats and sheep.

70. *Housing.*—Arrangements were made for the upkeep and maintenance of the Government houses at the La Pastora and Brooklyn Settlements to be taken over by the Department from the Planning and Housing Commission. No further Government houses were erected on settlements during the year but wherever practicable assistance has continued with the provision by sale of building materials.

71. It may be pointed out here that La Pastora and Brooklyn are the only two settlements where Government houses exist and it is notable that these settlements are invariably completely tenanted.

72. House construction by individual settlers is frequently a matter of some difficulty. However, 51 houses were so erected during the year.

Agricultural Credit Societies.

73. Fifteen new Agricultural Credit Societies were registered and the registration of two societies was cancelled during the year, so that at the end of the year there were 107 societies with a total membership of 3,673. Of these societies, 69 in Trinidad and 17 in Tobago were financed by Government, while the remaining 21 societies in Trinidad were financed by the Ste. Madeleine Sugar Co. Ltd.

74. Advances to Societies during the year aggregated $204,576, Government advancing $150,916 and the Ste. Madeleine Sugar Co. $53,660. Societies made loans to 3,343 members for the following purposes—$96,762 for cultivating canes; $68,339 for ground provisions, $5,359 for other crops, $24,732 for purchasing livestock; and $9,384 for repairs to buildings.

75. Government-financed societies owed Government $21,652 at the beginning of the year, but repayments during the year fell short of new loans and $47,363 was owing at the end of the year. The Usine Ste. Madeleine societies' repayments exceeded new loans, and their indebtedness to the Company was reduced during the year from $5,575.75 to $1,950.63.

Agricultural Co-operative Societies.

76. The Tobago Lime Growers' Association had a satisfactory year processing 12,522 barrels of limes to produce 6,550 lb. of lime oil.

77. The Cooperative Citrus Growers' Association expect to manufacture some 200,000 cartons of juice during the 1945-46 season compared with 115,000 cartons in 1944/45. The product is of an excellent standard which is fully supported by certified reports as to vitamin content, etc.

78. The Cooperative Cocoa Fermentaries in Tobago handled 107,308 lb. of wet cocoa. The grading of the final product has been satisfactory but improvement is needed in the curing operations.

79. Vegetable growers in the Aranguez area were addressed with regard to cooperative action for the disposal of their produce and after a series of meetings the constitution and bye-laws of an appropriate vegetable growers' cooperative marketing society were agreed upon and application for the registration of such a society has since been made.

Experimental Stations and Departmental Institutions.

St. Augustine Nursery and Experiment Station.

80. The Manager, Mr. R. E. Dean, reports a satisfactory year with distribution of economic plants including 18,666 budded citrus, 2,864 grafted mangoes and 4,379 budded avocadoes.

81. *Citrus.*—With the approval to lay down an accelerated programme of citrus propagation, a total of 208,000 seedling sour orange were lined out as stock plants. The aim of the programme is the production of 100,000 budded citrus plants in 1946 and 75,000 annually thereafter and for this purpose it was necessary to lay out an additional 10 acres of land for nursery stock purposes.

82. *Avocado.*—Pollock remains the most popular avocado variety but the late fruiting West Indian-Guatemalan hybrids are now in standard production with a view to extending the season of fruiting.

83. *Rubber.*—Budding of the high yielding oriental and of the leaf blight resistant clones continued with moderate success. We are indebted to Dr. Langford and Dr. Becktel of the United States of America, Department of Agriculture, for advisory visits in connection with rubber work and for valuable recommendations made in regard to budding technique.

84. Propagation of all clones received was undertaken to establish full lines in the stock beds and to complete the experimental block. Otherwise, multiplication during the year was confined to the four oriental (susceptible) panel clones G.V.21, G.V.31, G.V.37 and G.A. 255 and to the resistant top-budding Ford Brazil clones F.B.54, F.B.3363, F.211, F.409 and F.1620.

85. *Annual Crops.*—11,790 lb. of seed from selected maize types were made available for distribution as also was seed from the "La Siba" and "Tobago" varieties of pigeon pea. Several species of cover crop were re-introduced and an increased acreage laid down for seed purposes.

86. *Sugar Cane.*—Seven varieties were received from the Plant Quarantine Station for multiplication prior to release. Planting material of the varieties B.4148 and B.41227 were issued to Estates for trial under field conditions.

87. The manurial experiments on citrus were continued and land and stock prepared for the laying down in 1946 of a rootstock experiment for West Indian limes.

88. Other production from the Station during the year included 14,660 crates of citrus fruit, 5,523 boxes of vegetable seedlings and 26,469 ornamental plants in variety.

Government Stock Farm, Trinidad.

89. Mr. A. P. McWilliam was the Agricultural Officer in charge of the Government Stock Farm throughout the year and he reports in part as follows:—

90. The Farm generally has shown considerable progress during the year particularly so in the dairy and poultry sections. Labour showed some improvement but neither the class of labourer nor the standard of work carried out can yet be considered satisfactory.

Cattle

91. The work on cattle during the year has continued to have as its main objective, improvements in breeding, feeding and management for the increase of milk production. Investigations into past breeding records and feeding of calves on different rations have been undertaken and are dealt with under Investigational Work below.

92. The Dairy Herd consisted of 13 head of pure-bred Holstein-Friesians, 359 grade and cross-bred Holstein-Friesians, 24 Sahiwals and 15 Dairy Zebus. These figures include 110 bulls of all types, the retention of this large number being necessary pending completion of the analysis of breeding records.

93. The milk production was 493,475 lb. showing an increase of 60,000 lb. over 1944. The herd, which was regularly tested for butter fat and was always well above the required standard, has been divided into groups. The first contains those animals which by constitution, appearance, milk yield, fecundity and quality of offspring will be retained as first class stock. The second group consists of those which fail in one or other point but which are otherwise worthy of retention, while the third group consists of those which should not be retained but are not immediately discarded as they pay their way. This last group will be the first to go when young stock proving themselves better are brought into the herd.

94. The pure-bred imported Friesian cows still require more attention and feed than the grade herd. It appears that the three-quarter Holstein is the most generally satisfactory animal not only in the first but also in the subsequent generations. However, the vital statistics of the herd now being analysed will shortly confirm or deny this.

95. In the meantime a three-quarter bred bull "Ballou II" out of "Belle I", who is now nineteen years of age and produced over 10,000 lb. of milk in her last lactation, was used on the majority of the herd. Unfortunately this animal reacted to the T.B. test and had to be destroyed but has been replaced by "Ballou I" of the same breeding. Neither "Ballou I" nor "Ballou II" are as yet proven sires and so as a safeguard, other apparently good bulls of good breeding are also being used so that other breed lines will remain open.

96. The limited number of pure-bred Holstein cows continues to be put to a pure-bred Holstein bull and Sahiwal cows are put to a pure-bred Sahiwal bull. The dairy strain of White Zebus which in the past had been mated to a pure-bred Holstein bull are now being mated to a Sahiwal bull, both breeds being of Indian origin but the Sahiwal being of a better dairy temperament.

97. The Sahiwals have shown some improvement over their performance in 1944 in that one has given 3,914 lb. of milk in 311 days with a peak of 23½ lb. compared with 3,376 lb. in 332 days in 1944, while two others have given 1,856 lb. and 1,598 lb. in 159 and 210 days respectively.

98. The Dairy Zebus continue to be selected for docility and milking capacity but the best gave only 1,293 lb. in 135 days. In cross-breeding however with Holstein, they have produced valuable progeny with good constitution, improved temperament and increased milk production.

99. The Murrah Water Buffalo is included under the head of dairy cattle. Although generally thought of as draught animals, they perform the triple function of beef, milk and draught as has been particularly shown during the war. Their production of milk in a day without concentrated feeds is known to have reached over 20 lb. but for what duration it was not possible to record. The strength of the herd at the end of the year was six bulls, seven cows, three heifers and one bull calf. The bulls were stationed throughout the island for breeding especially on the sugar estates and there is a constant unfilled demand for them. The females are now in sufficient numbers to allow of milking trials, although owing to their temperament, especially strong stabling will be necessary before commencing any milk yield test.

100. *Calves.*—The system of calf raising was improved during the year by the sub-division of calf pens. Weekly weighing of all calves has shown the benefit of this measure which has also assisted greater individual attention. As a result of feeding trials detailed below, calves are showing an excellent response to heavier feeding in the younger stages.

Horsekind.

101. The Trinidad Turf Club presented "Portora", a fine grey thoroughbred stallion to the Department of Agriculture for its use and Mr. J. Fernandes generously lent his thoroughbred stallion, "Curragh Kid", to assist breeders by holding court at the Farm. This was of great benefit in meeting the demands of breeders especially so as one of the Department's stallions, "Bachelor's Tut" had to be destroyed during the year.

102. *Donkeys.*—Four Kentucky donkeys arrived from the United States in July—two jacks and two jennies—all four being fine specimens. One jack, however, landed with sallenders which is very slowly responding to constant treatment. These two stallions brought the Department's strength up to twelve and these are mainly stationed with breeding units throughout the Colony.

103. The number of jennies is steadily increasing and these are providing much needed smaller sized jacks suitable for district work.

Pigs.

104. The stock on hand of pigs of all ages at the end of the year was 130.

105. Selection has been carried out during the year for fecundity as well as for type suitability but work remains to be carried out on feeding for information as to weight gained for feed fed in order to establish and maintain an early maturing strain.

106. Tobago Farm was restocked from the St. Joseph Farm strains, as their pigs were lost from Swine fever, while individuals were also able to obtain stock at reasonable prices during the year.

Goats.

107. The stock on hand of goats of all ages at the end of the year was 135.

108. Several of the older does had to be replaced during the year while pens of both British Alpines and Anglo-Nubians were sent to establish goats at the Tobago Farm.

109. Four British Alpine and two Anglo-Nubian bucks were imported during the year at a cost of almost $2,000.00. One of the British Alpines arrived suffering from pneumonia and in spite of skilled attention, died. The aged British Alpine buck, "Widdington Woden", while stationed with a breeder in Port-of-Spain fell ill and was returned to the Farm. He has since recovered and will now be retained at the Farm.

110. During the year 538 does were served by Government Farm bucks.

Poultry.

111. The year was successful as far as supplying the needs of the public were concerned but it was a difficult one in respect of supplies of material and equipment.

112. Poultry stock at the end of the year numbered 1,145 and egg production for the year showed an increase of 11,000 over 1944. Sales during the year included 63 hens, 110 cocks, 1,377 week-old chicks and 1,740 hatching eggs.

113. In December new blood comprising 16 cocks and 46 hens was received from the United States but neither the Rhode Island Reds nor the White Leghorns, from appearances, compared favourably with the existing strains on the Farm. However, future performances will show their comparative value.

Rabbits.

114. The Chinchilla Rex have practically died out. They proved disappointing throughout. These Rexes are essentially a furrier's rabbit and cold weather is necessary to bring a pelt to the correct stage for taking. Under local conditions, they never recovered completely from one moult before going into a second.

115. The Havana Rex have proved somewhat better in that they show more stamina. However, on the whole it would appear that the Rexes have no advantage here and that the Flemish Giants or grades are more suited to conditions in Trinidad and Tobago.

Cultivations.

116. Of the fodder field area, besides 10 acres which were temporarily loaned to the Departmental Nursery for the raising of citrus stock, forty acres were under elephant grass, and sixteen acres under Uba cane. Routine manuring with both pen manure and artificials was carried out and a programme of ploughing and replanting laid down.

117. An area of Guatemala grass was maintained as a nursery for planting material in 1946.

118. One acre of molasses grass was sown and a second acre established from cuttings. Both grew well but cattle showed no relish for the grass with which further feeding trials will be made.

119. Small areas of yam, cassava, hill rice and adlay were maintained.

Pastures.

120. Upkeep and sub-division of pastures was handicapped by lack of fencing wire. Trials are being carried out with the planting of Glyricidia poles to assist fencing purposes.

121. Treatment of pasture during the year was confined to regular cutlassing against weeds and old grass.

Coconuts.

122. The pigs received a daily ration of fresh coconuts as part of their feed which gave satisfactory results.

123. The grass under the coconuts continued to be cut for fodder and near the stedding to act as grazing for the water buffalo.

124. It is intended to supply the blanks which have occurred during the war years when labour was very short, by fresh coconut plantings.

Concentrated Feed.

125. The necessary concentrated stock food which had been in short supply from 1942 to 1944 became more readily available during the year, but at much higher prices than previously. Generally the feeds were consumed before costs were available and it was therefore quite impossible to make rations on a known cost basis.

126. The Diary Feed Schemes started in October, 1942 by the Government Farm, in conjunction with the Food Controller in an effort to use all available ingredients including food condemned for human consumption, damaged ships stores, sweepings, etc., was taken over by the Marketing Department in August 1945. The total amount prepared under the scheme was approximately 2,000,000 lb.

Dairy.

127. The dairy was improved during the year by repainting and by the installation of an automatic bottling and capping machine.

128. The purchase of milk from dairymen rose by 40,000 lb. over the 1944 figures and the facilities offered by the Farm for the purchase, processing and distribution of milk to schools have given an impetus to milk production. This scheme also kept the Farm in close touch with dairy owners and vice versa when both information and advice could be readily sought or given.

Breeding Units and Individual Sires.

129. Breeding Units were maintained at the Government centres of Mucurapo, River Estate, Manzanilla, Sangre Grande and La Pastora. Stud animals were also on loan to private persons at the following places d'Abadie, Debe, Guapo, Woodford Lodge, Coora, Cedros, St. Ann's, Heights of Guanapo, Allandale Settlement, Couva, Mayaro, Tacarigua, Arima, Toco, Curepe, Princes Town, Palo Seco, Orange Grove, Waterloo, Perseverance and Ste. Marie Estate.

130. In addition, boar pigs have been stationed at St. Joseph, Curepe, Mount Hope and d'Abadie to give pig breeders every assistance since the bringing in of sows for breeding to the Government Farm has been stopped in an effort to reduce the possibilities of Swine Fever being brought into the Farm.

131. The following services were recorded during the year at the Stock Farm and at the breeding units but the list excludes services by animals lent to private individuals.

Sire	*No. of Services.*
Pure-bred bulls	670
Grade bulls	378
Stallions	63
Jack Donkeys	68 (Jennies)
Jack Donkeys	21 (Mares)
Buck goats	540
Boar pigs	75
Rabbits	12

Buildings.

132. Apart from maintenance, two of the young calf boxes were subdivided to allow for only two calves per pen and four additional poultry runs were erected to ease overcrowding. Several poultry houses and trap nests were also constructed.

Investigational Work.

133. A commencement has been made with the compilation of the dairy herd records dating back over many years. These figures when completed will need thorough analysis to assess the value of the various lines of breeding that have been followed and are a clear necessity in deciding future breeding policy.

Calf Rearing.

134. A group of three-quarter bred Holstein calves have been fed on rations similar to those fed to experimental groups in other countries. The calves are being allowed free access to food, but receiving a maximum of 6 lb. of feed, up to the age of twelve months. At this age, the feed is reduced to 5 lb. per head per day and continues at this rate. Unlimited grass of good quality is fed and from the age of 12 months, ample grazing is also made available. At the age of twelve months, the average weight per calf was 454 lb., the average weight at birth having been 60 lb. These feeding trials continue, it being hoped to carry on until the animals enter the dairy herd as cows, at possibly a very much earlier age and as bigger and stronger animals than under existing management.

Silage

135. A very carefully controlled silage was made from Elephant Grass in one of the tower silos, the age of the grass, how it had been manured, the weight per acre also the loss in moisture for each hour after cutting, being recorded. Samples were taken and analysed twice per day during filling while the corresponding portion was buried in a plastic mosquito netting bag at known depths in the silo for future data.

136. It is intended to use this silage in a double reversal feeding trial against dry season Elephant Grass.

Education

137. The commencement of vocational training on the Farm took place during the year with two groups of four soldiers each who spent a few months working in each section of the stock.

138. Visitors to the Farm during the year numbered over 1,800 people and included overseas delegations, excursions from schools and other educational centres and a meeting of the Agricultural Society of Trinidad and Tobago.

Tobago Farm

139. In accordance with the plans for developing the Tobago Farm, steps were taken to increase the accommodation available for livestock. Construction of buildings to house a small dairy herd and for accommodating a milk processing plant was commenced and orders were placed for dairy machinery and equipment.

140. Increases of livestock included the transfer of goats and pigs from the Trinidad Farm and, of the six mares of the grade Percheron type imported from Canada, four were allocated to Tobago. Two of these are in foal to thorough-bred stallions and two are in foal to jack donkeys.

141. The Hydraulics Department commenced an irrigation scheme for fodder crops on an eight-acre block. As an anti-malarial measure, it was necessary to control the water from a spring on the Farm. The spring has been contained and the waters therefrom canalised. The scheme when complete will ensure a good supply of fodder throughout the year and particularly in the dry season both for soiling and silage purposes.

River Estate

142. The area of this estate under forest and that planted up in timber trees was handed over to the Forests Department during the year.

143. *Cocoa.*—The Cocoa Research Staff of the Imperial College of Tropical Agriculture continued to record data from certain of the experimental blocks and in this connection valuable information was obtained on the spread and the effect of virus disease of which further mention is made below.

144. Fair crops of citrus and coffee were reaped. The tonca bean crop was poor but cutlassing of all fields and the thinning out of experimental blocks will have a beneficial effect on the coming crop.

145. The old cleared cocoa blocks were again turned over to food production and good crops of maize, adlay, hill rice and ground provisions were grown.

146. An increasing demand for Mysore bananas was met and this quick-growing banana is proving of value for ground shade and as a source of animal feed. As an eating banana, an appreciation of its slightly tart flavour can be easily acquired.

Royal Botanic Gardens and Government Grounds.

147. The grounds of the Royal Botanic Gardens, the Sunken Garden, Queen's Park Savannah and the Government Compounds under the control of the Department were maintained in a satisfactory condition during the year and various improvements were effected.

148. *The Sir George Huggins Orchid Collection.*—The interest and value of the Gardens were enhanced by the generous donation by Mr. Robert Huggins of an orchid collection and a steel frame orchid house, owned by his late father, Sir George F. Huggins. The collection which comprises a most varied and interesting selection of introduced species and varieties also includes a number of outstanding *Cattleyas* for which the collection was famous. Special funds were made available for the transfer of the house and for its erection in the Gardens and it now forms one of the main attractions to visitors.

149. *Tourist Information Kiosk and Pavilion.*—Plans for the construction of a pavilion, to be staffed by personnel of the Tourist and Exhibition Board and to provide for an information and guide service to visitors, were approved. The site chosen, on account of its central position, is that of the old cottage by the western entrance to the Gardens. Building operations commenced at the close of the year.

Experimental Work.

Sugar Agronomy.

150. Mr. F. M. Bain, Acting Sugar Agronomist was in charge of this section until 30th November when he resigned from the service.

151. Mr. R. Ross, now Acting Sugar Agronomist, reports on the 1945 programme of experiments as follows :—

Field Experiments in Operation.

152. Out of the total of 54 experiments due to be reaped in 1945, twelve experiments remained unreaped due to fires and other unavoidable causes.

153. Thirty-six varietal experiments, five manurial experiments and one experiment on methods of planting were harvested on soil types which have been described.

154. The effects of the treatments of varieties on yield of cane and sugar and on crop quality will be recorded in detail in the Annual Report for 1945 on Field Experiments on Sugar Cane in Trinidad to be published by the Sugar Cane Investigation Committee.

Manures.

155. In the two permanent manurial experiments on the Ste. Madeleine Estates there are no signs of the beneficial effects of sulphate of ammonia diminishing as a result of its continued application.

156. Treatment with two forms of nitrogen (sulphate of ammonia and ammonium nitrate), under trial at the Ste. Madeleine and Orange Grove Estates, gave rise to significant increases in yield of plant cane. On the latter estate, treatment with sulphate of ammonia gave a significantly greater yield of plant cane than treatment with ammonium nitrate.

157. In another experiment on the Ste. Madeleine Estates, treatment with superphosphate had no significant effect on the yield of standover plant cane.

Planting Methods.

158. An investigation into the effect of increasing the number of double plants had no significant effect on yield of cane or sugar.

Varieties.

159. There were twenty-three varieties under comparative test. The experiments revealed that B.34104 should be planted on loams to clays that are well supplied with moisture, while B.3337 is likely to do better on light soils on the flat or on soils of heavier texture, particularly on sloping lands where a distinct shortage of moisture in the dry season is likely to occur. It appears to be essential that these two varieties should be planted early in the season. The results also indicate that B.37172 and B.37161 should be extended on a fair scale to all soil types and conditions so that adequate data should be available for making a more detailed study from the viewpoint of commercial field and factory requirements.

Cocoa Agronomy.

160. The Cocoa Agronomist, Dr. B. G. Montserin reports as follows :—

Cocoa Rehabilitation

161. Activities centred largely on the Cocoa Rehabilitation Scheme under which a start was made in the distribution of high yielding clonal cocoa for replanting.

162. Applications for replanting were received from 138 proprietors with respect to 800 acres. This called for the production of 100,000 plants for allocation on the basis of a quarter of the full quota during 1945.

163. The output of cuttings at La Pastora Station amounted to 140,000 of which 90,000 were distributed or used in the extension of nurseries leaving a balance of 50,000 towards 1946 issues.

164. New applications for 1946 replanting to-date total 54, for which provision of 45,204 plants will be needed. In addition, allocations to previous applicants amounting to 179,000 bring the total requirement to 224,204 plants.

165. In spite of difficulties experienced in securing materials for construction of and repairs to the propagators considerable progress was made during the year. By the end of the year 38 units at La Pastora and 2 at King's Bay were in active production.

166. At Marper Farm, 5 new units are under construction, at King's Bay 3 units are nearing completion and at La Pastora 7 units only of the total complement of 45 units await supplies of glass and domestic cloth in order to be operated.

167. Throughout the year observations were made on the difficulties encountered in the technique of propagation with a view to stabilising routine operations. The La Pastora Station had an average of 60 per cent. successful rooting for the year.

Witchbroom Resistant Clones.

168. The 32 clones from the Amazon Valley planted at River Estate were kept under observation and cuttings of most of them were successfully rooted at the La Pastora Station. Two of these clones have shown no infection of Witchbroom while eight others have had only a single infection during two years of observation.

169. Witchbroom resistant trees at Marper of local and of South American origin were kept under observation and several which have shown no infection during the past nine years were propagated. Nurseries of clonal material from these were established and propagation for experimental purposes and for distribution is being carried out.

Hybridisation

170. Attempts were made to hybridise I.C.S. (Imperial College Selection) and W.B.R. (Witchbroom Resistant) trees, but difficulty was experienced owing to the distance over which flowers with anthers in the right condition had to be taken for cross-pollination. In order to overcome this, several I.C.S. clones were planted adjacent to W.B.R. trees at Marper and the work will be undertaken as soon as flowers are available.

MISCELLANEOUS CROP INVESTIGATION.

171. *Hill Paddy.*—Ten varieties of reputedly high yielding types of hill rice were grown on recently felled cocoa land at River Estate. Yields varied from 1,540 lb. to 3,204 lb. dry paddy per acre. The varieties were very mixed, however, and single head and early maturing selections were made from each plot in an attempt to isolate desirable pure lines.

172. *Salt Tolerant Rices.*—Twenty-two varieties of salt tolerant rices were under trial at Bejucal. Each variety was grown both in brackish water and in fresh water. Uneconomic yields were produced in brackish water and only a low average yield in fresh water. Variety No. 7 gave the best yield in both salt and fresh water at 925 lb. and 3,919 lb. dry paddy per acre, respectively. Single head selections were taken from each variety.

SPECIALISTS' REPORTS.

Plant Pathology.

173. The Plant Pathologist, Mr. C. A. Thorold, reports in part as follows :—

174. *Witchbroom Disease of Cocoa.*—Check blocks of trees counted in Tobago showed that there was no unusual increase in the incidence of brooms as a result of the decision to withdraw control gangs which had previously removed all brooms on sight. Observations on these trees also confirmed the very low incidence of pod infection in Tobago as compared with Trinidad, where pod losses may be considerable.

175. Applications of Bordeaux Mixture are being tested as a means of control for Witchbroom disease but results are not yet available.

176. *Pink Disease of Cocoa* (*Corticium salmonicolor.*)—This disease was found to be destructive on cocoa in the Mausica area. In particular, recent plantings of clonal cocoa, comprising rooted cuttings and budded seedling stock were seriously affected with ' pink disease '. There was also a considerable amount of dieback, which could not be attributed to parasitic fungi. This area of cocoa also suffered from witchbroom disease. The presence of these three diseases in a block of unusually uniform cocoa, through its having been propagated vegetatively, rendered this site an admirable one for undertaking spraying experiments. Preliminary trials were started in May and continued for three months. In the light of results obtained then, further experiments began in September and are being continued at the present time. Grateful thanks are due to the owner, Linton Gibbon, Esq., for his generous cooperation in permitting the use of his cocoa for these experiments. The first objective was to determine whether Bordeaux Mixture, or some other fungicide, would effectively control ' pink disease '.

177. Complete control of ' pink disease ' was achieved in this experiment through the use of either Bordeaux Mixture or Bordinette applied fortnightly. Applications of these fungicides were also associated with a statistically significant reduction in the amount of dieback.

178. *Virus Disease of Cocoa.*—A preliminary survey of the cocoa areas of Trinidad and Tobago has shown that the occurrence of virus disease is restricted to an area in the north-west of Trinidad which extends from the Ward of Diego Martin in the West, to the Maracas Valley in the East. Virus disease symptoms can be seen in trees which vary, as regards general vigour, from a state of debility to that of apparent good health in other respects. It has not been possible to determine the effect of virus infection on the current cropping and future yielding ability of old estate cocoa trees in general. However, results obtained by Professor R. E. D. Baker of the Imperial College of Tropical Agriculture, from observations on young clonal material, indicate that virus infection can seriously reduce the yield and vigour of affected trees.

179. It was agreed that the first requisite was an intensive survey of the affected area in order to determine the number and distribution of affected trees, so that measures for the control of the disease could be formulated. Accordingly, a sum of $3,500 was provided as a grant from Cocoa Subsidy Funds towards the cost of maintaining a staff of inspectors to carry out this survey which began on 3rd December.

180. In the course of the search for virus symptoms, healthy and affected trees were systematically counted on every property and estate. In addition, virus affected trees were marked to facilitate finding them again should destruction be undertaken. In the month of December, 1945, approximately 17,000 trees were examined in the Santa Cruz Valley, of which some 2,000 were found to be showing virus disease symptoms.

181. *Mosaic Disease of Papaw.*—The cultivation of the pawpaw is severely handicapped by what is believed to be a virus disease, against which, to-date, there are no effective control measures. Experiments undertaken to observe whether fertiliser applications might have an effect on the severity of the disease showed that the dressings, although increasing the yield of fruit, had no effect on the incidence of the disease.

182. The vector of the papaw mosaic disease in Trinidad has not yet been determined but from observations of the spread of the disease through the block of papaw where the fertiliser trials were carried out support is given to an hypothesis that the disease is transmitted by an insect which travels comparatively short distances and is aided in its dispersal by air currents, in that original infection and spread of the disease were from the outside rows facing the direction of the prevailing winds.

183. *Bacterial Wilt of Tomato.*—This continues to be the major disease prejudicing the successful cultivation of tomatoes in Trinidad. It appears that the causal organism (*B. solanacearum*) is of common occurrence in local soils, in that the first crop of tomatoes raised on ' new ' land may contract the disease.

184. The incidence of this disease in relation to preceding crops has been observed in a number of market-garden properties, where rotations vary greatly. It appears that certain crops may particularly affect the incidence of wilt disease in the succeeding crop of tomatoes. An attempt is being made to establish whether there is such an effect, and a suitably designed field experiment has been laid down for this purpose.

185. *Mosaic Disease of Sugar Cane.*—Routine inspections and rogueing of mosaic-infected stools have been continued.

186. *Immortelle Disease—Shade Tree Trial.*—Blocks containing fifteen different trees were planted at Santa Carlotta and Grand View Estates in 1940 and 1941, with the object of finding a suitable shade tree for cocoa to replace the ' Bocare Immortelle ' (*Erythrina glauca*) in places where there are losses of this shade tree through fungus disease (*Calostilbe striispora*).

187. It was found that these trees had developed sufficiently for it to be possible to draw some preliminary conclusions as to relative suitability of the trees. Height, girth and spread were measured in addition to general observations on the habits of the trees.

188. None of the trees in this trial, which includes both ' Bocare ' and ' Anauca Immortelle ' (*Erythrina Poeppigiana*), has suffered from ' Immortelle Disease ' fungus. This result is not unexpected, because ' Bocare ' trees do not generally succumb to this disease until they are about 20 years old, whilst the ' Anauca ' tree is more difficult to infect than the ' Bocare '.

189. As a preliminary conclusion from this trial, it appears the *Peltophorum ferrugineum* is a suitable tree to substitute for ' Bocare ' when a high canopy of shade is not required. In places where the cocoa trees become relatively tall, it is suggested that either *Schizolobium excelsum* or *Parkia Roxburghii* should be tried as a substitute for ' Bocare '. The Jiggerwood (*Bravaisia integerrima*) which is an indigenous tree, known also as White Mangue, has made excellent growth on very wet land and would appear to be suitable for planting as a shade tree under such conditions, although this species has not a good canopy spread.

190. Other investigations carried out during the year included studies of Soft Rot in cabbage (*Bacillus carotovorus*); Black Rot in cabbage (*Xanthomonas campestris*); a root disease of rice which appears to be similar to the conditions described in British Guiana as ' man rice '; and Black Rot in Sweet Potatoes (*Cerastostomella fimbriata*).

191. *Rum Vat Yeast.*—For a number of years, attention has been given to the utilisation of the yeast formed during the fermentation of molasses for the production of rum. The yeast which accumulates at the bottom of the vat is generally discarded but experiments had already established that it could be employed in the feeding of stock, as a source of both protein and vitamins. However, there were certain technical problems concerned with the recovery and use of this material, before it could be generally recommended and marketed for inclusion in the rations fed to stock. Official enquiries with respect to these problems were made in 1944 by Mr. C. A. Thorold during a visit to Canada and the United States. In submitting a report on his findings, he recommended that further enquiries in Trinidad would require the combined consideration of a team of specialists in the several technical 'fields' involved. Accordingly, His Excellency the Governor appointed a Committee of five, with Captain H. V. M. Metivier, Deputy Director (Animal Husbandry) as Chairman, to undertake studies on the recovery and use of rum vat yeast. Three meetings were held during the year, when various aspects of the problems confronting the Committee were discussed. Consequently, certain technical changes are being tried with a view to improving the quality of the 'waste' yeast.

192. A number of cultures of yeasts, moulds and bacteria was sent to Dr. Lynferd J. Wickerham, Zymologist of the Fermentation Division at the Northern Regional Research Laboratory of the United States Department of Agriculture for report during the year and this opportunity is taken of expressing gratitude to him for his very kind assistance.

193. Grateful thanks are due to the Director and staff of the Imperial Mycological Institute for assistance in various ways.

Entomology.

194. The Entomologist, Mr. A. Pickles, reports that in the course of the year, he was appointed Secretary of the Local Industries Committee by His Excellency the Governor. He continued his duties as member of the Sugar Cane Investigation Committee and of the Plant Quarantine Committee. In the month of October he visited Venezuela for a period of two weeks as agricultural member of the goodwill mission to that country.

195. During the year the personnel of the division of Entomology was strengthened in accordance with the recommendations of the Agricultural Policy Committee. In addition three guards were appointed to assist the Plant Quarantine Inspectors at ports of entry.

196. Advisory work in Agriculture, formerly a function of the Agricultural Society of Trinidad and Tobago, was transferred to this Division and Mr. E. A. Emond, formerly Inspector of Apiaries under the Society, retained this appointment as a member of the Division of Entomology. In this connection, a demonstration apiary has been established at St. Augustine with seven colonies of bees, all headed by young vigorous queens reared by the grafting method.

197. *Sugar Cane.*—Froghopper injury was not particularly severe during the year but was rather widespread in northern areas. A little over 2,000 acres were affected by blight but this was of serious economic consequence in a little over 100 acres according to reports received from the estates.

198. Much of the time of the laboratory staff was occupied with the preparation of a summary of froghopper incidence since the commencement of detailed records. In connection with this work small scale maps of all the sugar estates were prepared and the relative severity of infestation of each field as indicated by the records was shown graphically by different densities of shading. The preliminary incidence maps have now been completed but still require final revision. The maps have been studied with the Soil Chemist and it appears that ample evidence will be forthcoming to establish a relation between soil characters and freedom from froghopper injury.

199. Detailed observations on physical and biotic factors affecting the magnitude of froghopper populations were commenced at Caroni Estate. By standardised methods populations of eggs, nymphs and adults were assessed weekly, together with assessments of populations of fungus and insect parasites and predators. In addition, the total evaporating power of the air for each week was determined by Livingstone atmometers and the soil moisture and soil temperature at noon were also determined weekly. The data so obtained have not yet been studied in detail, but they indicate already that green muscardine fungus is capable of reducing froghopper populations to a very significant degree and that the incidence of this parasite is, in accordance with expectation, dependent upon atmospheric humidity.

200. Large-scale field experiments were conducted on insecticidal control of froghoppers, in which the insecticides studied were Sabadilla and D.D.T., both separately and in admixture with each other. Dusting sulphur was employed as a diluent. Treatment with weak mixtures of D.D.T. and sulphur was of doubtful value, but a mixture containing 4 per cent. of D.D.T. applied at the rate of about fifteen pounds per acre produced highly satisfactory control and reduced froghopper populations by 84.9 per cent. This mixture was found to exhibit a marked residual effect extending over about eight days after application and, even when numerous mature nymphs were present in the treated fields, adult populations remained at a very low level for at least a week after dusting. Control of adult froghoppers amounting to 82.9 per cent. mortality was obtained by dusting the affected fields with Sabadilla and sulphur, 50 per cent. of each, at the rate of 20 pounds per acre. While the immediate mortality obtained was satisfactory there was no residual effect and there was a marked tendency for large adult populations to accumulate within a few days after dusting unless the applications were made very close to the peak of emergence. Mixtures of 50 per cent. Sabadilla and 2 per cent. D.D.T. also gave very satisfactory results in which the immediate lethal effect of Sabadilla and residual effect of D.D.T. were apparent. It is a matter of considerable regret that scarcity of supplies of D.D.T. prevented further and perhaps more conclusive work being undertaken.

201. Laboratory studies were conducted to investigate the effect of reaction of the medium on oviposition by froghoppers. The insects were allowed to lay for three weeks in strips of blotting paper soaked in buffer solutions, representing different levels of a wide pH range. The results were highly irregular and no conclusions could be inferred. It seems possible that the chemical constituents of the buffer solutions may have introduced complications.

202. *Food Crops.*—Observations on the infestation of cucumbers by *Diaphania hyalinata* and *D. nitidales*, commenced in 1944, were continued. A summary of results to date show that recumbent plants (non-staked) gave a significantly greater yield of healthy fruit than climbing plants (staked). In a trial with treatments of no insecticide, dusting with lead arsenate and dusting with 5 per cent. Cubé powder superimposed on treatments of staking versus non-staking, much the best yields were obtained from non-staked plants which were dusted at weekly intervals with Cubé powder.

203. Further experiments were conducted on the effect of insecticidal treatment on the control of *Hellula phidilealis* on cabbages and cauliflowers. In both cases the treatments were weekly applications of lead arsenate dust, of resin wash and of Cubé dust, compared with no treatment. In both experiments plots treated with lead arsenate or with Cubé gave significantly better yields than those which were untreated or which were sprayed with resin wash. In the case of cauliflowers, treatment with Cubé appeared to be better than treatment with lead arsenate but a converse result was obtained in the cabbage experiment. As Cubé is a non-poisonous insecticide, its use by market gardeners was officially recommended as a result of these experiments.

204. *Crab Damage to Rice.*—Observations were made on swamp crabs which seriously affected young rice in the Bejucal area in 1944. This species has not yet been identified but specimens have been collected for submission to specialists. The crabs are active in the flooded fields during the wet season and mating and oviposition occur before the fields dry out. Adult females in "berry" prepare aestivating chambers when the water is withdrawn, beneath the earth bunds and, when the soil begins to dry out, the entrance to the chamber is closed. The eggs hatch with the advent of the rains and the old females, with newly hatched progeny attached to their abdomenal limbs, again become active for a short period, but die within a few weeks of emergence from the aestivating chamber. By this time the young crabs are capable of independent existence and it is at this stage that they occasionally cause serious damage to newly-planted rice. It appears that control should be attempted by destruction of adult females at the end of the wet season, while their aestivating chambers are still open and before their eggs are hatched.

205. *Stored Products.*—An experiment on the use of "inert" dusts as grain preservatives was conducted comparing the effect of addition of 1 per cent. "micronised" felspar and "Fygran A" with no treatment. After admixture with the preservatives the grain was replaced in bags and allowed to remain for eight months before examination. All the bags in both treated series, as well as the bags of untreated grain, were heavily infested both by weevils and by *Plodia interpunctella*. 11.69 per cent. of the grains in the untreated series, 37.24 per cent. of those treated with felspar and 34.45 per cent. of those treated with "Fygran A" remained uninjured. The preservatives accordingly had reduced insect infestation significantly, but not to such an extent as to prevent serious economic injury.

206. *Incidence of Economic Insects.*—Among the pest insects submitted by members of the district staff the following may be mentioned :—

Sweet Potatoes	...*Megastes grandalis* ;
Cabbages and Cauliflowers	...*Hellula phidilealis* ; *Pieris monuste, Plutella maculipennis, Brevicoryne brassicae.*
Melongene	...*Corythaica monacha* ; *Epitrix sp.* Beetle borers, unidentified (comprising a weevil and a Longicorn). *Salissetia oleae* ;
Cucumbers	...*Diaphania hyalinata* ; *D. nitidalis* ;
Citrus	...Unidentified weevils ; *Chrysomphalus ficus* ; *Orthezia praelonga* ; *Lepidosaphes gloveri L. Beckii* ; *Selanaspidus articulatus*

Soil Chemistry.

207. The Soil Chemist, Dr. E. M. Chenery, reports that his department is fully occupied on "a complete and effective soil survey of all agricultural lands in the Colony" as stressed by the Agricultural Policy Committee. To this end work during the year included the following :—

(i) A reconnaissance survey of Tobago to aid in the formulation of a Land Allocation Policy. A report and map have been submitted to the Lands Advisory Committee.

(ii) Cooperation with the Cocoa Agronomist and the Land Settlement Supervisor in arranging a policy on the future 'Land Use' of all properties then occupied by tenants of the Food Controller totalling in all some 22,500 acres.

(iii) A detailed survey of Caroni Estate.

(iv) A survey of Woodford Lodge Sugar Estate. For this purpose field maps were compiled from aerial photographs, since no accurate surveys of these lands were available.

(v) Detailed surveys of La Virtude and of Montserrat Estates.

(vi) The compilation of soil maps and/or reports for the following estates :—
Forres Park Sugar Estate, Tortuga, San Pablo, San Salvador, San Jose, Santa Maria, San Pedro, all in the Montserrat District, Santa Cecelia in the Siparia District and the Market Garden of the U.S. Naval Base, Chaguaramas.

(vii) Opportunity was taken of a geological survey of Kern Trinidad Oilfields properties to run concurrently a soil survey of this area, in collaboration with the Geologist and Plantation Manager of Kern Trinidad Oilfields. An area of over 1,200 acres was covered, represented by over 3,000 samples. A Soil Map is now being compiled from the data obtained.

208. Salt determinations have been made at the request of the Irrigation Engineer, Hydraulics Department, for the delineation of salty soil areas in the El Soccoro district. Soil data have also been obtained for the Irrigation Engineer to help in the choice of sites for sluice and pumping station in the Caroni Swamp; and Caroni River silt has been collected and examined with a view to determining its value in swamp reclamation schemes.

209. At the request of the Secretary of State, a scheme of classification was drawn up showing the relationship of the soils of Trinidad with those of Puerto Rico.

210. During the year comparisons have been made of the efficacy of extractants in recovering plant nutrients from the soil. It has been found that neutral half-normal ammonium acetate is more satisfactory than the commonly used half-normal acetic acid.

211. Analyses of leaves of the lime have been carried out to provide information required by the Citrus Agronomist in an investigation on the widespread dying out of lime trees.

212. A trial extraction of Ylang-Ylang oil from the flowers of *Cananga odorata* was made by steam distillation. The oil which was separated from the steam distillation by ether extraction, was reported on in New York as "first quality". The yield obtained was double that said to be obtained commonly in the Far East.

Veterinary.

213. The Deputy Director (Animal Husbandry), Captain H. V. M. Metivier, reports as follows:—

Proclaimed Diseases.

214. *Anthrax.*—One case occurred in the Toco district in the month of June. The usual precautions under the Diseases of Animals Ordinance were taken.

215. *Swine Fever.*—On the whole the incidence has been lower especially during the second half of the year. Outbreaks occurred in the south of Trinidad, Mayaro, Ste. Madeleine Village and Cedros and in the north at Toco and Diego Martin. The ban on the export of pigs to Trinidad from Tobago was removed in March and the Island Ward continued to be free of the disease throughout the year. The pigs on both Stock Farms and at six piggeries were vaccinated with Crystal Violet vaccine and the results have been satisfactory in that outbreaks have not occurred there.

216. *Paralytic Rabies* (*Bat transmitted*).—Cases of this disease occured in the Mayaro district during the first quarter of the year following an increase in the incidence of bat-biting of animals. The peasants' animals as well as stock on all the large coconut estates were vaccinated against the disease and the bat destruction units of the Medical Department carried out a campaign in the Mayaro area.

217. *Rabies* (*Ordinary*).—Six dogs were quarantined during the year on arrival in the Colony. The Police rounded up all unlicensed dogs in the various districts of the Colony and destroyed all those unclaimed.

218. *Equine Encephalomyelitis.*—No cases of Equine Encephalomyelitis occurred during the year and as the Colony has been free from the disease since March 1944 it was recommended to Government that the Proclamation prohibiting export of horsekind from the Colony without the approval of the Director of Agriculture should be removed at the end of the year. Another Proclamation enforcing the vaccination of all horsekind, working or stabled on the Queen's Park Savannah, against this disease was also cancelled. As a precautionary measure animals were vaccinated in the first quarter of the year against this disease in the Counties of St. David and Victoria where the incidence had been highest during the outbreak.

219. *Tuberculosis.*—The routine testing of all dairy cattle in the rural districts around Port-of-Spain was completed during the first quarter of the year and there were no reactors reported from these small dairies usually in the hands of the peasants. At the Government Stock Farm, Valsayn, there were 12 reactors in 480 animals tested, but in all of them the infection was slight, four animals showing no microscopic or naked-eye lesions. Two reactors were reported in Tobago.

Non-Proclaimed Diseases.

220. *Internal Parasites.*—These were again responsible for a good deal of trouble in young stock. Preventive treatment was carried out on some of the larger estates with good results. It is hoped that the District Staff will soon be in a position to help the peasantry to carry out regular monthly treatments especially during the wet weather.

221. *Brucellosis in Cattle, Contagious Abortion.*—The incidence of this disease which is known chiefly in the large dairies was further reduced during the year.

222. *Strangles and Influenza.*—These diseases were chiefly restricted to the sugar estates following the introduction of large Kentucky mules from the United States.

223. *Pneumonia in Calves.*—This condition has been chiefly due to overcrowding and unhygienic conditions. The housing of calves in small enclosures to accommodate one or two animals will do a great deal to overcome this trouble. Liberal supplies of bedding and, if necessary, the housing of calves on wooden floors have been recommended by the Department.

224. *Tetanus.*—With the better treatment of wounds in the Colony, especially castration wounds, few cases have occurred.

E. W. LEACH,
for Director of Agriculture.

10th July, 1946.

SECTION III—PUBLICATIONS.

Report on Control of Panama Disease (Proceedings of the Agricultural Society, XLV, Part 1, pp. 39-41)—C. A. Thorold, Plant Pathologist.

A Brief Account of the Results of the Citrus Experiments at St. Augustine Station (Proceedings of the Agricultural Society, XLV, Part 1, pp. 51-65)—F. M. Bain, Former Citrus Agronomist.

Can You Grow a Tomato Tree? (Proceedings of the Agricultural Society, XLV, Part 2, pp. 119-121)—Dr. F. J. Pound, Senior Agricultural Officer.

A Progress Report on the Dying of Limes (Proceedings of the Agricultural Society, XLV, Part 2, pp. 123-149)—F. M. Bain, Former Citrus Agronomist.

The Moisture Profile in Some Trinidad Forest and Cocoa Soils (Tropical Agriculture, Vol. XXII, No. 6, June 1945, pp. 100-115)—Dr. E. M. Chenery, Soil Chemist, Department of Agriculture and Professor F. Hardy, Imperial College of Tropical Agriculture.

Preparation and Packing of Honey for Export (Proceedings of the Agricultural Society, XLV, Part 3, pp. 205-210)—E. A. Emond, Inspector of Apiaries.

Observations on a Trial of Trees as Shade for Cocoa (Tropical Agriculture, Vol. XXII, No. 11, November, 1945, pp. 203-206)—C. A. Thorold, Plant Pathologist.

SECTION IV—LEGISLATION.

	Date	*References.*	*Remarks.*
		AGRICULTURE	
Interim Price for Farmers' Canes	2. 1.45	Production of Cane & Sugar Ordinance, 1944, Section 9 (1)*a*	Minimum rate of $5.50 per ton as interim payment to be made by Sugar Manufacturers against the price of Farmers' Canes prescribed during 1945.
Sugar Quotas Order, 1945 ..	30. 1.45	Sugar Quotas Ordinance, Ch. 23. No. 13	Allocation of Sugar Quotas for local consumption 1st February, 1945 to 31st January, 1946.
Agricultural Credit Bank ..	18. 5.45	Agricultural Credit Bank Ordinance, 1945	Empowers the bank to make loans to Credit Societies for the development, maintenance and improvement of lands.
Agricultural Co-operative Societies	18. 5.45	Agricultural Co-operative Societies (Amendment) Ordinance, 1945, No. 15 of 1945, Ch. 23. No. 3	Provides for the repeal of sections 31 and 32 and paragraph (30) of Section 67 of the Agricultural Cooperative Societies Ordinance to enable the Agricultural Bank to finance Cooperative Societies.
Agricultural Credit Societies	18. 5.45	Agricultural Credit Societies (Amendment) Ordinance, 1945, No. 16 of 1945, Ch. 23. No. 4	Provides for the repeal of Sections 13 and 14 of the Principal Ordinance; also repeals and replaces Section 15 of the Principal Ordinance and the amendment of Section 16 of the Principal Ordinance.
Proclamation No. 23 of 1945	30. 9.45	Customs Ordinance, Ch. 32. No. 2, Section 38	Revocation of Proclamation No. 6 of 1943 prohibiting the exportation of coffee.
Sugar Quotas (Amendment) Order—*Gazette* Notice No. 176	11. 9.45	Sugar Quotas Ordinance, Ch. 23. No. 13	The amendment enables sugar manufacturers after 31st August in any quota year to dispose of the unsold balance of their quota in the remaining months of the quota period. Prior permission must be obtained to sell in any other period any quantity in excess of that approved for the periods specified.
Gazette Notice No. 216 Agricultural Credit Bank (Temporary) Regulations, 1945	9.10.45	Agricultural Credit Bank Ordinance, No. 14 of 1945	Regulations governing procedure for the granting of loans, etc. made by the Agricultural Bank.
Gazette Notice No. 224 Regulations under Section 41 of the Agricultural Credit Bank Ordinance, 1945	15.11.45	Agricultural Credit Bank Ordinance No. 14 of 1945	do. do. do.
Land Acquisition Ordinance	14.12.45	Land Acquisition (Amendment) Ordinance, 1945 No. 47 of 1945	The object of this Ordinance is to widen the right of appeal against an award made under the Land Acquisition Ordinance, 1941.
		VETERINARY.	
Gazette Notice No. 119 Infected Area Order	20. 6.45	The Diseases of Animals Ordinance, Ch. 25. No. 2 of Section 6 (5)	Declaring Salybia-Galera Estate, County of St. David, an infected area.
Gazette Notice No. 193 Revocation of Regulations	2.10.45	The Diseases of Animals Ordinance, Section 12, Ch. 25. No. 2	Revocation of the Disease of Animals (Inoculation of Equines) Regulation, 1943.
Gazette Notice No. 199 Revocation of Infected Area Order	4.10.45	The Diseases of Animals Ordinance, Sections 6 (5), 22 (1)	Revocation of *Gazette* Notice No. 119.